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Editorial Comment

FIFTH ANNUAL MEETING The Fifth Annual Meeting of the American College of Chest Physicians, held in St. Louis, May 13 and 14, was unquestionably the most enthusiastic one yet held by this organization. There was a registration of 102 fellows and some fifty guests, which indicates the great interest in the projects of the College.

A resume of the meeting in these pages must of necessity be rather superficial. The reports of activities of the various committees will appear in pages of forth-coming issues of *Diseases of the Chest*.

The place of any organization in the medical field is rightly judged on the basis of its activities toward the furtherance of medical knowledge and the betterment of the general health of the people. Fellows of the College should be gratified with the work done by the organization during the past year. The reports by the Committee on Undergraduate Teaching of Tuberculosis, and on the organization of state committees on tuberculosis, under the Pennsylvania Plan, were exceedingly interesting and valuable. Every fellow and every physician interested in the eradication of tuberculosis is urged to read these reports as

they are published. To the Committee Chairmen and members of the committees, the College is indebted for an excellent piece of work. These projects will be continued during the coming year.

At the St. Louis Meeting, a committee was appointed, by a vote of the fellows, to set up standards of approval of sanatoriums by the College. This Standardization Committee is to work out a questionnaire to be sent around to the various sanatoriums in the United States. It is the feeling of the officers that all institutions for the treatment of tuberculosis should be placed on some basis of recognition and this is a step in that direction.

The Scientific Program on May 14 was exceedingly interesting, as would be expected from the outstanding physicians and surgeons who made the presentations. In forth-coming years there will be a two day scientific program instead of the single day, as has previously been the custom. This broadening of the scientific work will bring forth more expression from the fellows of the College who have not been heard before.

The Board of Regents of the College, who are empowered to carry on most of the busi-

ness of the organization, voted unanimously to raise the annual dues to ten dollars per year, in order to provide funds for the continuation of the various committees interested in the projects of the College.

It is fitting that an expression of appreciation be extended to Dr. H. I. Spector, of St. Louis, for his excellent scientific exhibit at the American Medical Association Meeting, on the differential diagnosis of pleurisy with effusion. This exhibit, sponsored by the American College of Chest Physicians, was very interesting. It was highly instructive and was well attended and appreciated by the thousands of doctors who saw it.

We feel certain that the work accomplished by the College of Chest Physicians during the past year is a source of great gratification to Dr. Champ H. Holmes, of Atlanta, Georgia, the retiring president, and will be a source of inspiration to the in-coming president, Dr. Ralph Matson, of Portland, Oregon.

R. B. H., Jr.

THE FACTS AND SIGNIFICANCE OF THE TUBERCULIN TEST

It is true that the things most simple are often the things most significant. The tuberculin test, the skin test for tuberculosis, is significant. There is considerable confusion and misunderstanding concerning this tuberculin test, not only among the laity; but among the physicians as well. For the public to be educated in matters medical, the profession itself must perforce be so informed. It is with this in mind that I have selected this topic.

When tubercle bacilli first enter the body, wherever that may be, a small inflammatory focus is set up which drains into the neighboring lymph nodes. When this happens in the lungs, as it so often does, the small area of caseous pneumonia is usually situated well out into the parenchyma, and the drainage is into the hilar or tracheo-bronchial group of nodes. Thus, we have the primary or first infection of tuberculosis, and this sequence of events is called the primary complex. This may, and does take place at any age; but it is most common to early life. It has, there-

fore, been referred to as childhood or childhood type tuberculosis. The term primary or first infection tuberculosis is better.

During the establishment of the primary infection, a most important thing happens—so important that it has revolutionized to a large extent our concept of the pathogenesis and epidemiology of tuberculosis. It is this: The tissues of the body become sensitive, allergic, to tuberculo-protein. An expression of this allergic state is a positive tuberculin reaction. A positive tuberculin reaction, therefore, means that there is an infection by tubercle bacilli within the body; and that the body tissues are sensitized and prepared to react to the next contact with tubercle bacilli. This contact may come about by a release from within, or an invasion from without—endogenous and exogenous respectively. Conversely, a negative tuberculin reaction means there is no infection in the body and consequently no allergic state exists. The time that elapses between the entrance of tubercle bacilli into the body and the development of a positive tuberculin reaction has been estimated to be only about three to seven weeks.

The violent reaction between such sensitized tissues and tubercle bacilli, leads to the destructive form of pulmonary disease that we commonly know and so frequently encounter. Technically, it is termed the re-infection type of tuberculosis. There can be no re-infection type of the disease without a preceding primary infection. The primary infection itself as a rule causes little damage. In the vast majority of instances healing by encapsulation and calcification follows. In infants and older negroes it may be very stormy and rapidly merge into the severe disease processes of the re-infection type. Ordinarily, many years intervene between the two. The primary infection in its very beginning can be exquisitely determined by the tuberculin test, and by it alone.

The tuberculin test affords one of its most valuable services in case finding surveys in schools, colleges, and large industrial groups. It readily screens out the non-infected and leaves only the infected for further examination. The enormous economic saving is apparent. A positive reactor among children,

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particularly in the pre-school age, strongly suggests the home as the source of the infection. Many cases of open tuberculosis have been ferreted out in this manner. If a tuberculin test were performed on every human being, and all the positive reactors given an x-ray examination—then practically every case of tuberculosis would be discovered. The expense of such an undertaking is, of course, prohibitive.

At the present day, the concentration of effort in case finding surveys has been shifted to the high school age; for there it is found that by x-raying the positive reactors the greatest number of cases of pulmonary tuberculosis, at or about the time it develops, are discovered. Less attention is paid the group from childhood to young adult life, as here very little happens. The age period, 5 to 15 years, may be aptly called the silent period of tuberculosis.

With few exceptions as in terminal or overwhelming disease and shortly following some acute diseases, notably measles—a positive tuberculin test is almost absolute proof of the existence of a tuberculous infection. The conclusion to be drawn, therefore, is that every reactor is a potential possible victim of tuberculosis. The protection against exposure to an open case will constitute one of the main chapters in the future program of tuberculosis control. In the differential diagnosis of a case, a negative tuberculin reaction aids greatly in ruling out tuberculosis.

Now briefly, something about the performance and interpretation of the test itself. After cleansing the surface of the forearm with alcohol or acetone, 1/10 cc. of the tuberculin is injected intra-dermally. A sharp, 26 gauge 1/2 inch needle and a 1 cc. tuberculin syringe are used. Immediately following the injection, and at the puncture site, there forms when the injection is properly made, a small round white elevation or wheel. This

soon disappears. The test is then read at the end of 48 hours. Very occasionally there is a delayed reaction requiring 72 hours. A positive reaction consists of an edematous swelling surrounded by a reddened area. For the reaction to be considered positive, there must be a swelling or elevation. Redness alone will not suffice. By measuring this elevation in millimeters, the reaction has been translated into a scale of 1 plus, 2 plus and so on. Since there seems to be little or no correlation between the intensity of the reaction and the extent or activity of the lesion in the lung—this is largely being abandoned. Rather, we just say positive or negative, with the occasional use of the words suggestive, weak or strong.

There are several preparations of tuberculin; but the ones usually employed are the old tuberculin and the purified protein derivative, or P. P. D. The latter is definitely preferable, being more stable and more standardized. For the needle shy and young children there are patch tests on the market. Tuberculin comes in varying strengths. The weaker solutions should be used first to avoid the sore, painful arms and febrile reactions that may follow the use of the stronger solutions. To secure the best results, reliable results; it is imperative that proper materials and correct technique be employed.

C. M. H.

PRESIDENT ELECT Dr. John H. Peck of Oakdale, Iowa, was chosen President-Elect of the American College of Chest Physicians at the May meeting in St. Louis, to begin active duty July 1st, 1940, when the present incumbent, Doctor Ralph Matson of Portland, Oregon, retires. Doctor Peck has been Superintendent of the Iowa State Sanatorium for the past three years and also is President of the Iowa Sanatorium Association.

Congratulations, Dr. Peck! We are sure that the College has made a wise choice.

F. W. B.

A Consideration of Certain Respiratory Phenomena Resulting from the use of Tobacco*

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DUE TO an unfortunate error in publication, I must take the privilege of announcing that I am not prepared to address you upon the effect of tobacco smoking upon the respiratory tract, nor do I feel that anyone is prepared at this time to take a definite stand upon such a topic. Despite the widespread use of this agent, it would seem, from a review of the literature, that but little of definite nature has been done with sufficient degree of thoroughness to warrant the presentation of a paper of so definite a character. It is my purpose to merely consider certain respiratory tract phenomena which may result from the use of tobacco.

I concede the wisdom, as one not averse to the smoking habit, to preface my remarks by an assurance that I am not riding a hobby, nor conducting an anti-smoking campaign, nor am I working in the interest or disinterest of any element of the tobacco industry. Any observations which I have made, or any deductions which I may have drawn in this discourse, were merely inspired by my frequent contact with the ulterior manifestations of its use. To resort to the vernacular, there may truly not be a "*Cough in a Carload*" of cigarettes, but in a carload of smokers it is most likely that there will be cough to some extent. Further, the nonchalance with which we accept a so-called tobacco cough would put to shame the merchant who first capitalized upon the relationship between a brand of cigarettes and nonchalance. In this respect our concern about parallels Mark Twain's story with reference to the weather. You will recall that he said something to the effect that we all grumble over the weather, but no one does anything about it.

Having thus brought up the subject of the so-called tobacco cough, I wish to review hastily one or two pertinent facts relating to

the act of coughing. It should be recalled that the original larynx, conceived some odd millions of years ago, undoubtedly evolved as a sphincter built within a ring shaped cartilage for the express purpose of shutting off the lower respiratory tract, when circumstances of feeding occasion it. Its prime function today remains essentially the same as it was originally. However, evolution has placed upon the larynx several added responsibilities, some of which follow:

First, that of helping to regulate alveolar air pressures.

Second, the splinting of the thorax for purposes of pectoral exercise, defecation, parturition, etc.

Third, the highly specialized function of originating phonation.

A fourth and most damaging function, which the larynx has assumed, is its participation in coughing. In order to accomplish a cough, the sphincter is tightly closed and a very sudden increase in thoracic pressure is built up. When the pressure reaches its maximum, there is a sudden explosive release of air with an expiratory blast, which constitutes the cough. The two latter functions, namely, phonation and coughing, may not properly be considered as either original or normal functions of the larynx and, as a consequence, intemperance in the practice of either of these functions is prone to produce chronic tissue changes. I feel certain that very, very many of us Americans, who are constantly "out of voice," are suffering from a low grade chronic hypertrophic laryngitis, resulting from a so-called tobacco cough. In those cases where simply a loss of quality and smoothness of tone is noted and in which but little is demonstrable within the larynx, it is most likely that the extraordinary use of the laryngeal sphincter in coughing has caused a loss of fineness of texture of the proximal cord edges.

In recognition of the fact that little if any

* Read at the Philadelphia County Medical Society, March 8th, 1939.

tissue study seems to have been done upon the membranes of the lower respiratory tract in cases of abnormalities resulting from tobacco smoke, it will be my plan to attempt to apply its known effects, particularly upon certain elements of the peripheral circulation to the respiratory tract mucous membranes, recalling that from the turbinates within the nose to the alveoli of the lungs this tract is concerned with a conditioning and a utilization of air by highly specialized blood bearing vessels.

If we study tobacco and its smoke from the standpoint of the tissues which it may effect, its versatility will probably be astonishing and, at the risk of going somewhat afield, I shall review briefly some of the high lights of its recognized pathologic manifestations. That there is some protein, or some undetermined constituent of tobacco or its smoke, to which certain people are allergic has been proven by published results of many studies by competent observers. Harkavy¹ studied intracutaneous and patch tests with denicotinized tobacco extract and found that "of 166 male cigarette smokers in the hospital, with all kinds of affections, but excluding those with peptic ulcer or disease of the coronary arteries, 9 per cent gave positive reactions; of 60 with peptic ulcer, 27 per cent were positive; of 26 with arteriosclerosis of the extremities, only 1 reacted; and of 87 with thrombo angiitis obliterans, 87 per cent gave reactions. Two reacted out of 5 with migrating phlebitis. With a solution of nicotine tartrate, there were no reactions at all in 12 smokers. Thus in peptic ulcer, coronary sclerosis and angina pectoris, many more than the average gave reactions to nicotine free tobacco and in thrombo angiitis obliterans, nearly all were positive."

In tobacco eczema, Sulzberger² subsequently summarized a similar study—"Some cases of certain diseases of the vascular system (thrombo angiitis obliterans, angina pectoris, coronary disease) clinically long considered to be in some way connected with smoking, are manifestations of hypersensitivity in certain segments of blood vessels to circulating allergens derived from or contained in tobacco." And further "not only sudden and evanescent reactions are elicited when the excitant meets the specifically sensitized shock tissue, but chronic reactions and permanent

organic damage are often caused by one or successive shocks resulting from such encounters."

Many tobacco buyers and workers are known to be subject to eczema and other erythematous or maculopapular rashes when handling certain tobaccos. Further, many older smokers report that they find themselves progressively limited in the amount of smoking, which they can do without producing circulatory or respiratory discomfort. This probably indicates a progressively increased sensitization.

Local irritation of the tongue, pharynx, larynx and trachea is most frequent and probably results mainly from irritating products of combustion, which products will be tabulated later, or to hygroscopic agents, or heat. It has been estimated by Bastedo³ that if three-quarters of a cigarette is smoked, the lips and tongue temperature may reach 140°; the temperatures resulting from cigar stumps may reach 190° Fahrenheit.

It is well known that cancer of the mouth, lips, tongue, larynx, pharynx, etc., is more prevalent in smokers than in non-smokers. However, it is interesting to note that the increase in the number of women smokers has not been paralleled by a corresponding increase in the incidence of cancer of the mouth and adjacent regions in women.

Among other well known effects of tobacco poisoning are ambliopia, tinnitus aurium, and nerve type deafness. In the realm of the gastro-intestinal tract, various observers have reported that in tobacco users there is a great tendency to heartburn, symptoms simulating duodenal ulcer, cardio spasm and pyloro spasm. Studies in gastric function and behavior show a primary rise in the secretion and the motility followed by a diminished secretion and a diminished motility. Smoking thus, it would seem, inhibits hunger and lessens appetite. On the intestines, x-ray studies have shown a colonic hyperirritability which produces either diarrhea or a spastic constipation.

While the effects of tobacco upon the heart are not of major interest in the production of respiratory tract effects of smoking, it seems that its effects upon the blood vessels are particularly applicable to the subject, due to the intimacy of blood and air in the respira-

tory tract. For this reason, I will dwell in greater detail upon these items.

Maddock and Coller⁴ observing smoking effects upon medical students noted a rise of 8 to 38 pulse beats per minute from a single cigarette, with a return to the previous rate in from 5 to 30 minutes. Similar findings to these have been reported by many many observers. Stachelin having smoked 6 to 8 cigars daily for 6 months noted an average pulse rate in himself of 82. During abstinence, 75 was his average pulse rate. During this latter period, a standard amount of exercise caused his pulse rate to rise to an average of 124, while during the smoking period it averaged about 157.

My own observations upon blood pressure readings before and after smoking coincide very closely with the figures which are quoted above. The environment under which we studied a series of students was this,—they were asked to come for observation at 9 o'clock in the morning without having used any tobacco since the previous night. The observations were made in one of the operating rooms and it was anticipated by the observers that blood pressure readings and pulse rate readings would probably be in excess of normal, due to the psychic features which attended the reporting to an operating room for more or less poorly understood observations. We planned to make three series of observations, each to consist of blood pressure and pulse rate recordings, visual impressions of the color of the nasal mucous membranes, and the degree of patency of the nasal cavities. Color photographs were then to be taken of the nasal, pharyngeal and laryngeal mucous membranes.

The first observations were made before smoking, the second immediately after smoking, and the third ones a half hour later. Thirty per cent of non-smokers were used as controls. Average figures showed an increase in blood pressure and pulse rate following smoking, while observations upon the controls at the same time showed lowered blood pressure and decelerated pulse rates. Upon the third observations, most smokers showed a blood pressure which was lower than the original reading and likewise a slower pulse, while the controls remained about as before.

Many observers, including Maddock and

Coller⁴, Barker⁵, Wright and Moffatt⁶ and others have demonstrated that 1 to 3 cigarettes diminish skin temperature as much as 10° F., this being interpreted as an evidence of vaso constriction. This effect was more marked on inhaling rapidly. The usual time necessary for a return to normal skin temperature was about 30 minutes. Also, it has been noted that there is an immediate rise in blood pressure with each smoke, available records testifying to averages of 8 to 20 millimeters of mercury. Accompanying this rise in blood pressure there is a decrease of blood flow averaging 57 to 83 per cent. It has also been noted that repeated cigarettes produce repeated similar reactions. These reactions, as noted above, are usually followed by a fall in blood pressure, an increased blood flow, indeed at times with such suddenness that it causes symptoms of collapse.

It is my purpose to make some deductions referable to the respiratory tract based upon these known effects upon the heart, circulation, blood pressure, skin temperature, etc. For purposes of illustration, the mucous membranes of the upper respiratory tract, including the hypopharynx and larynx, might be considered as similar to body surface, in that they are directly exposed to air. If, therefore, the inhaling of the smoke from 1 cigarette can reduce surface temperature up to 10° and maintain it so for periods up to 30 minutes, imagine the serious way in which its use handicaps the intricate thermal mechanisms of the nose and throat, and particularly the embarrassment to the accurate chemistry demanded of the lungs.

It is my opinion, though I have found no reports of studies which will either prove or disprove it, the respiratory tract effects of excessive smoking (which term "excessive" can only refer to one's individual susceptibility) must bear some analogy to Buerger's disease, in that the etiologic factors are identical and the exposure to the poisonous agents is much more direct. I can imagine that with each cigarette or cigar, or pipe load, the vessels of the respiratory tract suffer a sudden contraction. Likewise, if the blood flow is diminished to possibly 10 to 15 per cent of normal, and the blood pressure is increased, the mucous membrane function is arrested. After a period of 30 to 40 minutes, the blood

pressure has returned to or below normal, the vessels are relaxed, blood flow is increased, tissue secretion is very much activated and respiratory capacity diminished. The user at this time experiences the other let down effects known to involve the nervous system, the gastro-intestinal system, etc., and he is prompted to "*Satisfy, Call For, Walk a Mile, or Reach For*" the stimulus which will again, as the catch phrases have it, "*pick him up*" by a repetition of his incessant smoking.

In the observations upon students in which visual notation was made of the patency of the nasal cavities and the approximate color of the mucous membranes, both before and after smoking, it was definitely observed that in virtually all cases the membranes were less colored after smoking and the airways were definitely more patent. While the students could not estimate changes in color, they did, almost without exception, confirm my visual impression of patency by remarking that the airways seemed more clear. These observations were made in a relatively warm room and it was our observation that control cases who did not smoke suffered a reduction in airways in the same environment. Photographic recordings of the size and patency of airways were made in color in an effort to portray these findings in demonstrable fashion. Unfortunately, at this time the photographic research work has not progressed to a stage sufficiently satisfactory to warrant us presenting it to you as a scientific exhibit. None the less, the visual findings, while not recorded in units of this or that, have been observed on many many occasions and I feel very safe in presenting these observations to you as facts.

A daily routine of these rapidly changing phenomena repeated 20 to 40 times can, and no doubt does, cause chronic secretory changes, altered response of the mucous membranes to environmental changes, relaxation and undue thickening of surfaces and sub-surface tissues, with shortness of breath, cough and hoarseness.

Smoking has become so universal, especially in the United States of America, and the so-called tobacco cough has become so common, that we have never accepted it generally as a pathologic entity. However, consider-

ing the number of persons who I, as an individual, see in varying degrees of mental disturbance resulting from the worry of a chronic throat consciousness, or a chronic hoarseness, whose only demonstrable illness is the respiratory tract manifestations of tobacco usage, I wonder how many millions of cases of permanent physical or mental change could be tabulated, if we were all tobacco conscious to the degree of recognition of this situation when we see it. Only in this way could its seriousness be properly appraised.

I wish to recite, in rather conspicuous brevity, some facts about a few cases which appeared to be of tobacco origin, out of a great number of cases which I have observed. In these cases it has been my opinion that tobacco was the major factor in either their physical or mental discomfort. First, an observation relative to cases of contact ulcer of the larynx. Of these, I have seen but a few, possibly 10 cases, but in no case in my experience has simple voluntary aphonia been sufficient to effect a permanent cure, nor have I observed any cases in which the condition arose in a non-smoker. In all cases which I have seen, it has been necessary to include withdrawal of tobacco in the therapeutic program in order to effect reasonably prompt recovery. I am inclined to feel from these observations that tobacco plays a definite part in the production of contact ulcers.

I have in mind a man, a cigarette smoker, age about 50, who developed such laryngeal consciousness in association with a cough, which he recognized as a tobacco cough, that he came to me for inspection of his larynx, having satisfied himself that he either had tuberculous laryngitis or a malignant new growth. Increased redness of the mucous membranes, with an irregularity of the proximal surfaces of the true cords, was all that could be ascertained upon laryngeal examination. A short period of total abstinence from tobacco resulted in the complete loss of the cough and prompt return to comfort in his laryngeal area.

In the case of a young woman in her middle twenties, laryngeal region consciousness was again an outstanding symptom, and in association with the discomfort was a very loose

productive cough. Her immediate family history with reference to pulmonary tuberculosis was extremely bad. An x-ray of her chest, however, failed to reveal any evidence of an open tuberculous lesion and the roentgenologist, in reviewing these plates, made the remark that although one does not see the phrase in textbooks, he has learned to appreciate an appearance of chest x-rays to which he refers as "tobacco lungs". While this is not recognized as an orthodox diagnostic term, yet its casual use by an eminent roentgenologist at least testifies to the fact that tobacco damage to the lower respiratory tract can be demonstrated upon x-ray plates. And incidentally, appreciating this, I am at a loss to know just why sufficient interest is not taken in the tobacco cough and in its manifestations to properly catalogue it as a pathological entity. In any event, withdrawal of tobacco over a period of two months resulted in elimination of the cough and a complete loss of laryngeal region discomfort.

I recently saw a man of about 50 years, who had such infiltration about his laryngeal mucous membranes that saliva could always be seen in the pyriform recesses of the larynx and about the esophageal orifices. He had reduced his diet virtually to liquids due to dysphagia. A direct endoscopic examination showed some thickening in the cricoid narrowing, especially on the posterior surface. Several biopsies from this region were all reported as being negative to any evidence of malignancy. I advocated the removal of several devitalized teeth and a discontinuance of his smoking, which habit incidentally, he was carrying on to a marked excess. He reported within two weeks that he had such marked improvement, as the result of the discontinuance of his smoking, that he rather thought it might be unnecessary to have his teeth extracted. I insisted, however, on this part of my therapeutic program. At the present time this person has gained about fifteen pounds in weight and is eating on full diet.

These I present as only a very few cases to show that while a diagnostic term has not been placed upon certain phenomena which seem to be caused by the use of tobacco, these phenomena none the less, do exist and should be recognized by clinicians.

It might be of interest to know just what

it is in tobacco smoke which does affect the tissues. That it is not nicotine is fairly well established by much available information, excepting in cases of ambliopia and nerve type deafness. The furor raised some years ago in an effort to place the responsibility upon cigarette papers has been definitely quieted, as this source of irritation has practically been discarded. The allergic reactions in tobacco are definitely not to nicotine. Puffed smoke is composed of the alkaloid nicotine, pyridine and its derivatives, carbon monoxide, several aldehydes of which formaldehyde is the most prevalent, hydrocyanic acid, methyl alcohol, a volatile oil to which the aroma is partly due, and arsenic.

The irritating tarry oil which condenses in the bitter end of a cigar or cigarette, or in the stem of a pipe, is composed mostly of nicotine and pyridine bases. A second lighting of a smoke revolatizes these residuals and Bogen, studying this feature of smoking, determined that the last third of a smoke contained 15 to 66 per cent increase in nicotine and other volatile substances. In the light of these findings, the use of filters is a sound practice. The matter of the effects of the various hygroscopic agents has received considerable publicity. It is a conceded fact that tobaccos without hygroscopic agents produce fewer systemic effects.

Wright and Moore⁷ state: "The amount of nicotine and other products in the inhaled smoke is influenced greatly by first, and most important, the amount of moisture present

the drier the tobacco, the greater the destruction of nicotine." Dixon⁸ states that "The water content of tobacco is more harmful to the smoker than the original nicotine content." Flinn⁹ whose studies were subsidized by a tobacco firm, which uses diethylene glycol instead of glycerine as a hygroscopic agent, summarized a notable paper thus: "The combustion products of glycerine when it is used as a hygroscopic agent in cigarettes will, under certain conditions, cause an irritation of the throat. The combustion products of diethylene glycol cause only a slight irritation, if any." Haag¹⁰ on the contrary, reporting from the Department of Pharmacology of the Medical College of Virginia, and making a similar, though very thorough study upon animals, using the con-

junctival sacs and the peritoneum as his guide to effects, concluded by saying, "Smoke solutions prepared from the two types (diethylene glycol and glycerine) of cigarettes were found to have the same toxicity."

The question arises as to how to treat the tobacco cough and the resulting hoarseness. First, it is necessary to arrive at a diagnosis. The allergic case will have the entire tobacco syndrome, that is, the lack of poise, tremor, poor appetite, tendency to constipation. In all likelihood, he will react to a patch test for tobacco. He may indeed have a typical tobacco-alcohol synergism, and he may or may not show respiratory evidence of other pathology. I suggest this latter thought so as to remind those who are attempting to arrive at a diagnosis of some tobacco syndrome, that the presence of such will not eliminate other pathologies.

First, tobacco and alcohol should be entirely withdrawn and moderate reconstructive measures should be undertaken, especially out of doors exercise, fresh air and sunshine. The intake of calcium should be enhanced, either by the taking of milk, calcium gluconate, dicalcium phosphate, or any two, or all three.

Vitamins A, B and C, are routinely considered. In cases of severe mucous membrane change, the use of sodium nitrate, or various compounds based upon the sodium nitrate principle, should be used as in thromboangiitis obliterans. Vocal rest in cases of marked hoarseness is essential. If a patient will not discontinue smoking, then pure Turkish tobacco should be used exclusively. Such tobacco contains practically no hygroscopic agents and but little moisture. The patient not having developed a sensitization to it may smoke of it freely. In time, however, a sensitization will develop to this tobacco also, and it will be necessary to either make a new attempt at abstinence or to return to the American brands of tobacco. In a very short time, however, this procedure wears out and the situation becomes very trying.

So far as local treatment is concerned, little if anything is needed. Internally, however, the iodides will liquify the tenacious accumulations and will hasten recovery from the circulatory and mucous membrane changes which accompany this addiction.

In concluding, I maintain that there is much evidence to support an opinion that the mucous membrane effects of smoking are probably secondary to the many and often repeated shocks resulting from either atopic or acquired sensitivity to the combustion products of tobacco smoking, or to direct drug action, which lead to varying degrees of tissue changes. The tobacco catarrh should be considered as a disease entity and managed as such. I have been unable to find any literature bearing upon favorable results with the use of prepared tobacco antigens for respiratory tract manifestations, although they are used with great satisfaction in the eczemas seen in tobacco handlers.

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Tuberculosis in Curricula of Medical Schools

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IN REVIEWING the history of the campaign against tuberculosis in this country, we learn that during the past twenty or twenty-five years there has been a decrease from 200 to 50 cases of tuberculosis per hundred thousand of population. As we study the reason for this decline in the total number of tuberculous patients, we find, somewhat to our dismay, that it has been brought about largely by a campaign of prevention, carried on, for the most part, by lay workers.

We also find in this review two conditions which are more disconcerting to the medical men interested in tuberculosis. The first is that tuberculosis still occupies first place as the cause of death between the ages of twenty and forty. The second is, as Drolet has pointed out during the past year, that the death rate per tuberculous patient is still as great or even slightly greater than it was twenty or twenty-five years ago. Drolet, in his explanation for this, says that, while a certain percentage of patients do not consult a physician until they are in the advanced stages, the infrequent diagnosis of tuberculosis in its early stages and the lack of proper guidance of the patient after the diagnosis is made are the chief contributing factors.

There has been some question about Drolet's figures. However, regardless of how accurate they may be, it is felt rather generally by tuberculosis workers that what can be accomplished by those who have done so much in reducing the incidence of tuberculosis, in general, has more or less reached a saturation point and that further solution of our tuberculosis problem is going to rest, to a major extent, upon the shoulders of the family physician or the man in the general practice of medicine. It is the family physician who sees the patient first and who often has him under his observation for a long time before he sees a chest specialist or enters a sanatorium. The fact that from 75 to 90 per cent of the patients entering sanatoria are in an advanced stage bears out this statement. In addition, it is the family physician or the general man

who has the confidence of the patient and the patient's family and who is in a position to get him to do what he should to prevent the spread of the disease and to regain his health.

In passing the responsibility of our tuberculosis problem to the general man, we meet a serious stumbling block. Tuberculosis workers are more or less agreed that the majority of medical schools today do not train the student well enough, so that when he goes out to practice medicine he is equipped to handle tuberculosis. They feel that the schools have failed to stimulate his interest in the use of modern methods, which would make it possible for him to make early diagnoses. Nor have they impressed him with the importance and technique of prevention or of early intensive treatment.

Recent surveys carried out by the *American Medical Association* and the *American College of Chest Physicians*, relative to the teaching of chronic diseases of the lungs in medical schools, indicate that the teaching of this subject, except in a few schools, is now done little more effectively than it was twenty or twenty-five years ago. These same studies brought out the fact that in the major portion of the schools there is no comprehensive or uniform system for the teaching of this subject and that the information that is given to the student is offered in a piecemeal fashion, scattered over a four year period, and that there is a failure to connect the laboratory, the clinical and the social aspects of tuberculosis, so as to give the student a correlated working knowledge of the subject.

In the survey made by the *American Medical Association*, there was no specific mention made of tuberculosis in the reports from seventeen of the schools. In the survey made by the *American College of Chest Physicians*, about an equal number of schools failed to indicate that the subject of tuberculosis, as such, received any attention in the teaching system.

I realize that such surveys, as they must

be carried out, may not describe conditions as they actually are, but they do definitely indicate the trend of the work being done.

As the material in these surveys is studied, it becomes evident that in the majority of medical schools today, the student does not have an opportunity to familiarize himself with the different stages of tuberculosis or to follow the cases along, either through access to the clinical history or by a study of serial x-rays in clinical conferences, such as is done in some schools, or by periodic bedside contact with the patient, so as to understand the clinical course of tuberculosis or the end results.

It is particularly the opportunity to study and diagnose and to follow the earlier cases that will arrest the attention and arouse the interest of the student. But, under the present system of teaching, he generally sees what little he does see of the patient, more or less casually, perhaps in the general medical ward or, at best, in the special wards of the general hospital where there are usually only advanced cases and where the opportunity for the patient to overcome his disease is not very favorable. Thus, he sees tuberculosis at its worst and, consequently, does not become interested in the subject. The result is that he finishes his four years in medical school, not only without interest in tuberculosis, but with a vague and hazy idea of the whole subject. It has been my experience that a large proportion of the young doctors just out of school want to keep away from tuberculosis, not only because of the feeling that it is a hopeless proposition, but because they are afraid of contracting the disease themselves.

Again, during internship, the young doctor has very little opportunity for training in the diagnosis and treatment of tuberculous patients, inasmuch as only one out of twenty-four hospitals where internships are served, have a set-up suitable for the care of tuberculosis.

The *National Tuberculosis Association's* committee on the Care of Tuberculosis in General Hospitals summed up the situation with the statement, "The majority of patients come to this same doctor when he is out in the field of practice, complaining of things other than tuberculosis or even of symptoms referable to the lungs and they are treated

for other things, often over long periods, while their tuberculosis is allowed to progress unrecognized."

At the meeting of the National Tuberculosis Association in Los Angeles last summer, Dr. Casperis of Vanderbilt University stressed the point that after the physician has gone out to practice under conditions such as I have just described, we cannot rely merely on barrage after barrage of literature and continuous urgings to interest him in the subject of chronic diseases of the lungs. If we are going to arouse his interest in this subject to the extent that he will take a definitely progressive attitude in the handling of tuberculosis, we must, at some time in his training, contact him on an individual basis.

Under our present system of training physicians in this country, there is only one time when we have an opportunity to contact doctors, as a whole, on an individual basis, and that is when they are medical students. It is as a student that we can and must arouse the future physician's interest in tuberculosis. This can be done by impressing him with the bright side of the subject through training him to understand that it is not only a preventable, but also a very curable disease and by pointing out to him the part which he, as a practitioner of general medicine, will be able to play in its prevention and cure. Unless, during his training, the student's interest is aroused, after he goes out to practice he will not read the literature on the subject nor will he attend the lectures or post-graduate courses on chronic diseases of the lungs.

As we who are interested in the campaign against tuberculosis consider the situation that has just been described, the question that presents itself to us is, what can be done to improve the conditions?

Two months ago in Chicago, I attended a meeting of the *National Tuberculosis Association's* committee on Undergraduate Education in Tuberculosis. At the same time, I talked with a number of the Directors of the National Association who were meeting there then and also with Dr. Zapffe, Secretary of the Association of Medical Schools. There was a unanimous agreement among all these men that the manner in which the subject of chronic diseases of the lungs is taught in the majority of medical schools today is exceed-

ingly bad.

It was also felt by these same men, that in order to bring about the needed changes in this situation, we must endeavor to do two things. First, we must work out a plan, or a scheme or a method of procedure by which this subject can be adequately presented to the medical student. Secondly, we must devise a means by which the deans of the medical schools or the administrative bodies can be interested in what we may have to offer.

As regards the scheme, or plan or procedure of presenting the subject, there was considerable difference of opinion. There were a few who felt we should ask for more time in the medical course for this subject. There were others who felt that we should work out a definite outline, covering the various aspects of teaching tuberculosis, and present that to the different medical schools in the way of required minimal standards. There were objections to both these suggestions. It was felt that if we asked for more time, we would get a cool reception from the deans or those in charge of the curricula. Besides, it was felt that what we need mostly was more efficient use of the time now allotted.

While some thought that minimal standards, if they were broad and general, might interest the medical schools; there were others who felt that the time was not yet ripe for the adoption of minimal standards which could be generally applied.

There were still others, and they seemed to be in the majority, who felt that perhaps the best thing to do was to develop a scheme or plan wherein time or minimal standards would not be mentioned, but which would arrange to give the first and second year students a well-founded understanding of the pre-clinical phases of tuberculosis and where the third year students would be taught the value and the method of taking a careful history; would be made to understand the physical and x-ray signs of the normal and pathological chest; and would learn to correlate the findings of the pathological chest and the history with the pre-clinical phases so as to visualize the underlying pathology. A clinical clerkship in a tuberculosis institution would perhaps serve as the principal means by which the third year students would be taught.

In the fourth year, all the different phases of tuberculosis would be correlated under competent instructors. One of the essentials during the fourth year would be the out-patient chest clinic where the students would have an opportunity to see and diagnose the early cases and would be taught the public health and social aspects of tuberculosis through a well organized case finding program.

A second important factor in the fourth year would be the sanatorium. In the sanatorium, the student would have a chance to study the various types and stages of tuberculosis. Through periodic visits to the institution, he would have an opportunity, at least to some extent, to follow the course of the cases so as to become familiar with the uncertainty of tuberculosis as well as to appreciate the importance and technique of close supervision and detailed treatment. Bedside study for the student is an important factor in teaching. Oliver W. Holmes once said, "The most essential part of a student's instruction is obtained, as I believe, not in the lecture room, but at the bedside; nothing seen there is lost. The rhythms of disease are learned by frequent repetition; its unforeseen occurrences stamp themselves indelibly on the memory."

There is no thought of making the students specialists in diseases of the lungs, but simply to present the subject to them so that they will realize and understand what can be done in the handling of the disease and so that they will be able to think intelligently in the light of early diagnosis and in case finding and in the light of rational guidance of the patient, once the diagnosis is made. In other words, to have the possibility of tuberculosis, the importance of its early diagnosis, prevention and intelligent treatment constantly stand out like a red flag before the mind's eye of the practicing physician.

Any plan or line of procedure by which the subject of chronic diseases of the chest might be effectively presented to the medical student would, of necessity, have to be more or less elastic so that it might be adjustable to the conditions in the various medical schools.

There are certain basic requirements for the teaching of any subject. The first of these is that we shall have students capable of being taught. I feel that, under present conditions,

most of the medical students are in this class. The second requirement is that there shall be adequate teaching material. This requirement is not met at the present time in many of the medical schools, but could be, if the schools became interested in this subject. The third requirement is that the teachers shall be competent. Again, under present conditions, this requirement is not met in the schools as a whole.

A survey made three years ago by the organization now known as the *American College of Chest Physicians* showed that over 50 per cent of the teachers of chronic diseases of the chest were in the general practice of medicine. I doubt if any other specialty, even though it has a much less serious aspect, is taught in this manner. Here again, an aroused interest on the part of the schools would serve to correct this defect.

There have been various suggestions as to how to proceed to have any scheme that might be developed adopted by the medical schools. This would, no doubt, be more difficult than the working out of an adequate teaching plan. The first essential would be to interest the medical deans in the necessity for a change and the workableness of any proposed line of procedure.

Various means of securing the interest of the deans have been suggested. One has been the possibility of getting some man living in the vicinity of the medical school or already connected with it, who has not only an interest in tuberculosis, but a background which would enable him to teach the subject effectively, to establish an elective course in chronic diseases of the lungs in the school, the idea being that this elective course would be made so attractive that the great majority of students would take it and that such courses would tend to have the desired effect upon the deans of the schools. A great

deal of support could be given to these instructors by special committees on tuberculosis of county and state medical associations. One of the objectives of the *American College of Chest Physicians* is the foundation of such committees in the various states.

This elective course would be for the senior students and would be carried on as a supplement to the regular work in tuberculosis that is ordinarily offered by the school. Such a plan is now in operation in a few schools and the results seem very promising.

Time does not permit the discussion of other suggestions now. The committee of the *National Tuberculosis Association* on the teaching of this subject in our medical schools is at present working to develop not only a plan by which adequate teaching can be done, but also some method by which it may be possible to bring about the adoption of the plan. They hope to present a preliminary report at the Boston meeting this summer.

The development of a suitable system for the teaching of chronic diseases of the lungs in the medical schools has been one of the major objectives of the *American College of Chest Physicians* since its meeting in Kansas City in 1936, because it has been felt by some of us for a long time that this is not only one of the most important, but one of the most neglected factors in our anti-tuberculosis campaign. A committee from this organization has been working on this proposition ever since. It is hoped that these two committees can combine their efforts in the accomplishment of something definite. It is true that this is a big job and one which will require time, but there is a feeling that the majority of the medical schools, at the present time, realize the inadequacy with which this subject is handled and that they will meet us in a more or less receptive mood.

**FOR JUNE BRIDES . . . FOR JUNE GROOMS
FOR JUNE BIRTHDAYS**

We Suggest a Tuberculin Test

"Health Precaution Insures Happiness in Life"

Bronchiectasis

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New York City, New York

BRONCHIECTASIS is a condition of bronchial dilatation, the etiology of which is still controversial and the treatment problematical. Cases come to light much more frequently now because of the common use of intratracheal Lipiodol injection. We have come to realize that bronchiectasis does not exist only in the individual who brings up copious foul sputum and has clubbed fingers. We have many cases of bronchiectasis which are dry and are picked up only when infection sets in, or when hemoptysis of supposedly unknown origin occurs. Lipiodol injection into the bronchial tree makes the diagnosis definite.

The condition may be congenital or acquired. The configuration is either saccular (resembling grapes) or cylindrical (sausage shaped) which may appear at times as fusiform, with tapering ends (pencil shaped). There can be present one type alone, or a combination of both. The site is usually in the lower lobes, but may occasionally be in the upper lobes. The cylindrical variety has thickening of the bronchial walls and the saccular variety a thinning and ulceration of the walls. Hence, the greater and more frequent hemoptysis in the saccular type. Bronchiectatic bleeding is very common and varies from the slightest streaking to profuse hemoptysis. Death from this does occur, but is quite unusual.

The wet type is the noticeable one. Here we find copious sputum and clubbed fingers. If drainage is free, the odor may not be objectionable. If drainage is obstructed, then putrefaction takes place and the odor is foul. Physical signs will often show variations in breath sounds with numerous coarse rales. The peribronchiectatic pneumonitis may present itself as an acute bronchopneumonia. In contrast, the pneumonitis may be of a low grade type and the patient may appear to have a case of prolonged grippe or influenza.

The dry type is the one that is masked. It can be picked up only by a Lipiodol broncho-

gram. At least, one can not tell definitely by physical signs. The x-ray may show only a marked increase in root shadows. However, all patients whose chest x-rays show clouding of either cardio-diaphragmatic angles or a haziness along the border of the heart should have a Lipiodol bronchogram. These are the obscured cases, which often show bronchiectatic changes in back of the cardiac shadow. A wet type of bronchiectasis occasionally may become dry and present no symptoms or signs until subsequent infection sets in. The cavities are usually multiple and vary in size.

Amberson¹ and others have shown that the usual early lesion is an inflammation of the bronchial wall. The organisms present are most frequently streptococci, micrococci, pneumococci, and the influenza bacillus, alone or in combination. The progression of the pathology produces clinical evidence of a chronic bronchopneumonia. The early symptoms may be few, such as annoying cough and slight expectoration. The advancing involvement produces evidence of toxemia—rapid pulse, low grade fever, lassitude, ready fatigue and loss of weight and strength. The cough increases, often becoming paroxysmal and may be productive of either little or much sputum. This condition may subside and the recurrence be brought about by another upper respiratory infection.

The inflammation of the bronchial wall produces destruction of the sensitive mucous membrane with ultimate fibrosis of the bronchial wall structure. Distortion follows and stagnation of the secretions results. The chronic retention of infectious material leads to a surrounding pneumonitis and fibrosis. The terminal alveolar tree is obliterated by fibrosis and atelectasis. Then, depending upon the amount of involvement, a considerable quantity of pus may accumulate before it reaches normal, sensitive mucosa to start a cough reflex. Change in position will also cause coughing and bring about expulsion of retained secretion. The longer the secretion is retained, the more offensive is the odor.

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Pus from a freely draining bronchiectatic area has a rather sweet odor and produces no toxemia.

The etiology of bronchiectasis is still a controversial subject. However, it would seem that infection of the bronchial wall, with subsequent fibrosis and bronchial distortion, is the main cause. To be sure, mechanical factors help, but these alone are insufficient. When they are present in a bronchiectatic area, an associated infection is also present. It is remarkable how many cases also have an infection in the paranasal sinuses, and the same predominating organisms can be obtained from the discharge of these sinuses, as from the bronchiectatic pus. Partial obstruction of a bronchus, whether by foreign body, aneurysm or tumor causes a stagnation of secretion with subsequent local inflammatory changes. We must not forget that complete obstruction causes atelectasis.

It has been claimed that pulmonary interstitial fibrosis causes distortion of the bronchi with subsequent bronchiectasis. This has been disproved by Edlin and Tannenbaum², Gardner³ and Russel⁴, since pneumoconiosis, which is characterized by interstitial fibrosis shows a lack of bronchiectasis.

Chronic Pulmonary Tuberculosis, of course, produces a considerable amount of upper lobe bronchiectasis, but this causes no trouble because it drains so well. However, every once in a while we see a case with a marked bronchial stenosis due to tuberculosis. Here, of necessity, drainage is considerably impeded and non-tuberculous stagnation with subsequent fever, etc., is seen. Thoracoplasty operations can cause retention of secretion with subsequent bronchiectasis.

Purulent affections of the lung also create conditions favorable for bronchiectatic formation. Recurrent bronchopneumonias may not only be the result of bronchiectasis, but also the cause.

Sometimes upper lobe bronchiectasis is found in a patient who gives a history of pneumonia in childhood, possibly after measles, and who has been carried as a case of tuberculosis for years during adult life because of fibrosis seen on x-ray. Follow-up of several years, with thorough examination of the family and children will reveal no

evidence of tuberculosis. However, the Lipiodol study, peculiarly enough, will show large sacs which have an apparent cystic formation. True cysts would not admit Lipiodol, while this cystic appearing formation does. It is also not beyond the realm of possibility that occasionally a true cyst may rupture into a bronchus. In the condition described above, all the sacs readily admit Lipiodol.

In the supposedly congenital type, Sauerbruch⁵ described the finding of a dilated bronchus with hypertrophied or callous walls amid normal pulmonary tissue. Congenital dilatation of a bronchus per se is innocent. It becomes pathologic only when, as a result of superimposed inflammation, the secretions cannot be coughed up and continued suppuration ensues.

Watson and Kibler⁶ believe bronchiectasis to be on an allergic basis because 90 per cent of their cases showed manifestations of clinical allergy—positive cutaneous tests, hay fever, eczema, asthma, and an abnormally high percentage of eosinophils in the bronchial secretions. I regret that I did not perform cutaneous tests on all my cases, but asthma and hay fever were present in only a very small percentage. It is quite possible that the prevalent sinusitis in my series of cases masked the hay fever. However, asthma was not at all a common finding.

Persistent coughing has been presented as a great factor in the cause of this condition. However, Burrell⁷ has shown that cough is the result and not the cause of bronchiectasis. His observations at autopsy in cases of chronic bronchitis and very heavy smokers revealed no evidence of bronchiectasis.

The administration of Lipiodol is a comparatively simple procedure. Good anaesthesia with the ample pulling forward of the tongue are the prime prerequisites for a good result. The iodized oil can be given by several routes; the nasal, the oral, and the cricothyroid.

In the nasal route, we first clean out the nose by means of adrenalin. Then 4 per cent cocaine is dropped through the nostril several times, making the patient gargle as long as possible. The longer the gargling, the less cocaine is needed. The tongue is then pulled forward by the patient, holding the end firmly with gauze, and the cocaine is again

dropped through the nose, while the patient inhales deeply. He will cough and spray the anaesthesia about the area. Now, with the tongue again pulled out by the patient, and the torso bent slightly to the side of pathology, 10 c.c. of Lipiodol is dropped slowly through the nose. If both sides are required, the torso is bent slightly to the other side and another 10 c.c. is given.

In the oral route, the throat is sprayed directly and a similar procedure gone through, except that the iodized oil is dropped on the back of the tongue. We can also pass a catheter, with the aid of a laryngeal mirror, past the vocal cords and administer the iodized oil through this. Dr. Samuel A. Thompson of New York also uses a semi-rigid catheter with a curved end. After anaesthesia, he guides the tip with his finger past the epiglottis and then by twisting the catheter tip he can enter any lobe he desires, working best with the aid of a fluoroscope.

In infants and very nervous individuals, the crico-thyroid route is utilized. Novocaine is injected into the skin and subcutaneous tissues external to the crico-thyroid membrane. A short needle is then stuck into the trachea and about $\frac{3}{4}$ c.c. of 4 per cent cocaine is injected (in an adult). The needle is rapidly removed because the patient coughs. The cough sprays the mucous membrane and anaesthetizes it. Then with a straight needle, or, preferably, with a right angle Goodman needle the iodized oil is introduced. The patient is warned not to eat or drink for $1\frac{1}{2}$ to 2 hours after the procedure, depending upon the amount of cocaine used. Then he takes a saline cathartic and continues his usual activities.

Jacoby and Keats⁸ give children a general anaesthesia, using 0.1 G. of avertin per kg. of body weight. They also give a hypodermic of 1/150 gr. of atropine. Half an hour later, anaesthesia is induced with ether on an open mask until complete muscular relaxation is obtained and the pharyngeal and laryngeal reflexes are abolished. A Doyen's gag is introduced and the mouth opened widely. The tongue is pulled forward by the operator and the child put in a semi-sitting position and inclined toward the affected side. The Lipiodol is then dropped slowly over the back of the tongue, using 3 c.c.—8 c.c. The authors

believe that postural drainage should be done for several days prior to the Lipiodol injection. This course of drainage is worth doing on adults also.

In this clinic we use the nasal method, as advocated by Forrestier of France. We have used this method on children as young as five and six years of age successfully. The crico-thyroid method was used on infants in the hospital. It has also been used extensively on adults in other clinics.

Treatment should not be limited to one angle. Many factors should be taken into consideration in order to obtain the best results. The most important medical treatment is postural drainage. This simple and efficacious treatment is not used often enough. The patient must be told to drain himself several times daily for 15 or 20 minutes by clock, not mental time keeping.

Bronchoscopy should be performed for both diagnosis and treatment. Diagnostically, one may find evidence of stenosis or impacted foreign body. Removal of the obstruction or dilating the stenosis will manifestly help in overcoming the condition. Aspiration of pus from the diseased bronchi by bronchoscope will give more relief than all medical procedures.

Drugs by mouth or inhalation have been singularly unsuccessful. Garlic and inhalation of compounds of creosote and benzoin have been discontinued. Neosalvarsan intravenously may be used as an adjuvant early in an infected case, but it holds little value. Tonics are, of course, used in general routine care when indicated.

The thorough examination and care of the nasal accessory sinuses, to my mind, is one of the most important steps in the treatment. Clearing of the bronchiectatic condition depends largely on the curing of the sinusitis.

Autogenous vaccine therapy is helpful and should be employed. Too often this form of treatment has been used alone and not in conjunction with other methods.

Pneumothorax, phrenicectomy and thoracoplasty should not be used. They cannot change the pathology, but may cause gangrene by the kinking of a bronchus with subsequent anaerobic infection. However, favorable results have been reported from their use. If adhesions are present, pneumothorax.

of course, is impossible. I have seen it used as a life saving measure in one or two cases of dry bronchiectasis, when a complete exsanguination threatened because of massive bleeding. The usual bleeding of bronchiectasis is short and requires no special treatment. Crushing the phrenic nerve tends to weaken one of nature's aides in this condition, namely the cough. By paralyzing the diaphragm, the expulsive force of the cough, so necessary in expelling secretions, is greatly lost.

Cautery pneumectomy has been tried, found wanting and almost entirely discarded. With this procedure one cannot open up all the sacs for complete drainage to the exterior.

Although lobectomy still has a high mortality, it seems to hold the brightest avenue for cure. However, it cannot be performed until a Lipiodol bronchogram shows completely how extensive the condition is. Toxic patients have the highest mortality. The youngest patients have the lowest mortality.

The regular use of Lipiodol therapeutically is of great help. The oil is heavy, displaces the bronchiectatic pus and helps the individual to more readily expectorate the infected material. This is usually not needed during the summer.

Boerck and Harris⁹ have reported favorable results with the use of the x-ray. This procedure is still in the experimental stage and cannot be relied upon until a large number of cases are reported. Other investigators have tried this method and are at variance as to the results.

Dry warm climates have been advocated. It would seem that this is an excellent idea. Unfortunately, all patients cannot afford the expense of travel. The primary help in this field is due, I believe, to the drying out of the sinuses with secondary help to the bronchiectatic condition.

Summarizing, bronchiectasis is a condition of bronchial dilatation. Its cause is infection. A very large percentage of cases have sinusitis. Treatment is not limited to one method alone, but requires several procedures. Treatment of sinusitis is urgent. Bronchoscopy is necessary. Bronchial instillations of Lipiodol, and vaccine therapy are routinely useful.

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Some of the Problems of Tuberculosis

LAURIE LEE ALLEN, M.D.
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IN DISCUSSING the subject of pulmonary tuberculosis, we are aware of the many problems that confront us. There are three chronic diseases, namely: Tuberculosis, Syphilis and Cancer, which have kept the medical world in a state of confusion since their inception. I find it quite a task to even attempt to describe some of the phases of tuberculosis alone, yet, if you will bear with me, I shall venture a few points which might help make our general practitioners more "Tuberculosis Minded," thus bringing about an enthusiastic desire to make an early diagnosis and establish more stable methods of treatment for unfortunates who contract this disease.

Tuberculosis kills more people between the ages of fifteen and forty-five than any other disease. At this period of life, tuberculosis is still the *Captain of The Men of Death*, at a time when life should be at its best and its usefulness the greatest. This condition has existed for several generations and we ask the question, "Who is to be blamed?" and "What are we going to do about it?" If I am permitted to express my opinion, I would frankly say that it has been the fault of the general practitioner, the family physician, who has practically ignored this one disease. We are just beginning to make up our minds to do something about it. Had it not been for the few specialists in this line, the pride of our profession would be entirely lost. It is *this* neglect of the family physician in making the diagnosis and treatment of many of the more serious infections which has led to the cry for State Medicine.

We love to hear our profession lauded and heralded as the greatest boon to mankind and that we are living the lives of martyrs for the cause of human suffering, and yet how many of us realize that we are constantly betraying this great trust. There is no reason why every registered physician should not be able to make a diagnosis of the three most common diseases, namely: Tuberculosis, Syphilis and Cancer, and when the diagnosis is made refer those cases which are not in his

line of treatment to the men who do that specialty. It is the duty of every physician to see that the sick public gets the proper medical treatment. In other words, may I not say that we as physicians, in the eyes of the laity, are held in trust to be ready to make a diagnosis and administer care and treatment of all diseases allied to our profession, if not directly, then by the proper consultation. No physician should have too much pride to consult with his contemporaries in the interest of his patients in making the proper diagnosis and instituting the correct treatment. When I speak of consultation, I also have in mind the use of your hospital connections and Public Health Service which is offered in some degree by most every city of any size which has the proper interest in the public welfare. Many of the States and larger cities offer laboratory and x-ray service to physicians for diagnostic purposes, especially in Tuberculosis. But it is surprising to know how many of our physicians do not avail themselves of this opportunity. Now, since we have allowed tuberculosis to become a public health problem, let us co-operate with this department by assisting in making an early diagnosis and reporting cases promptly so that they can receive the quickest and most adequate treatment. You will find that your public health nurse will be of great assistance here. I have known many physicians to find fault with their field nurses because of their alertness. Diagnosis of cases has been made by them many times before the physician because of their careful scrutiny of the family history. In such cases, I have always been grateful for any information I could get from the nurse. Because of her alertness to their case histories I have been saved many embarrassing situations. The only fault I could find is that there are not more public health nurses.

There have been so many papers and broadcasting lectures on the subject of education of the public concerning this disease that I don't feel that I should utilize this little space in discussing the housing problem and the

education of the people in and out of school, but I would like to add that the promotion of these movements is also up to the private physician in his respective community. If the politics of medicine can be injected into public health work in the proper therapeutic measures so that the physician has the power of speech in the interest of his profession for the good of the people, then he is getting to the place where the best interests of all are enjoyed equally.

Now that we have spoken of tuberculosis in a general way, may I not speak more specifically on this subject? I feel that the best way to start the subject of this discussion relative to the infectiousness of this disease is to state emphatically that tuberculosis is a communicable and a contagious disease. The tubercle bacillus is the etiological factor and it is *not* an hereditary disease. So when it is contracted, it is by direct contact with persons who have this malady in the communicable form.

We have two kinds of tuberculosis caused by the same tubercle bacillus. One is known as the Primary or Childhood type, or the first infection, and the second is known as the re-infection or adult type. The Primary Tuberculous complex may be active or inactive depending upon the massiveness of the dose of infection, or the resistance of the patient respectively. Therefore, a positive tuberculin reaction in a child means that the child has become infected but may not have the disease in its active form. If active, it will be manifested by x-ray findings, constitutional symptoms, and often by a low sedimentation rate. I would like to add here that an x-ray is almost absolutely necessary in making a diagnosis of childhood tuberculosis because of the paucity of physical findings. May I also add, that it is my belief that most of our tuberculosis has its inception in childhood. It depends upon the *dose* of the infection whether the child becomes ill in childhood, or later in life, or at all. If the dose is small, one may harbor the bacilli all one's life without any active manifestations. On the other hand, if resistance is lowered by some intercurrent disease or some outside stress such as auto accident, childbearing, poor feeding, worry or hazardous occupation, etc., the capsule or capsules harboring the

bacilli break down, the bacilli escape, overpower the body cells and set up an active process in the lungs. Thus we have the adult type of tuberculosis, which is known as the endogenous type or reinfection form.

The exogenous infection which may come later in life superimposed upon the primary infection is a less frequent occurrence, although this type has caused considerable attention and discussion by such able pathologists and scientists as Opie, Sweany, Lang, Ranke, and others working in this field of investigation. The contention being that the primary infection offers an allergic, fertile soil for a further exogenous implantation which in turn sets up the adult type of pulmonary tuberculosis.

May I say a few words about diagnosis of pulmonary tuberculosis before closing this subject? Without any reservation, I feel that every physician should have a fluoroscope. The x-ray is useful in making a diagnosis of other diseases and injuries than tuberculosis. The fascinating interest in making a diagnosis of pulmonary tuberculosis is its differentiation from other diseases of the chest in which the x-ray is indispensable. Many active cases of pulmonary tuberculosis may have no physical signs nor even symptoms way into the moderately advanced stage, and yet the x-ray will reveal progressive lesions with beginning cavitation.

Pleurisy with effusion so often overlooked on physical examination is beautifully revealed by fluoroscopy or x-ray. All pleurisies with effusion should be treated as tuberculosis because practically 100 per cent are. Even when the fluid is negative for tuberculosis and the guinea pig is negative after inoculation with the fluid, we see these same cases develop active pulmonary tuberculosis months after the fluid is absorbed; this type of course would not include traumatic pleurisy and post pneumonic empyema. Of course, in the absence of x-ray, don't fail to do a puncture for diagnostic purpose. In the home, this might be the only means of making a diagnosis of fluid in the pleural cavity.

Did it ever occur to you that tuberculosis is one of the most easily curable of all chronic diseases? Did you not know that 90 per cent of cases begin as unilateral lesions free of

adhesions and amenable to cure within a brief period of time with artificial pneumothorax? Well this is true. Why we emphasize the early diagnosis of pulmonary tuberculosis is to avoid the late mutilating surgical procedures as in the case of thorocoplasty. Although a few rare cases can be cited where thorocoplasty might take the preference to pneumothorax in early cases. But since we are not discussing surgery, we shall leave this subject for a later paper.

In conclusion, I would like to express the desire that the time will soon come when every tuberculosis patient may have the advantage of sanatorium treatment. It has always occurred to me that patients without the advantage of a well managed sanatorium and its teaching have lost their best opportunity to make a complete recovery. There are so many things that a patient must know in order to recover from his illness and maintain his health after recovery. Unless a patient is schooled in the finer points of his cure taking, he makes a complete failure in spite of surgical aid. Fresh air, good food, rest, and self discipline, are just as essential as the pneumothorax, phrenic nerve block or thorocoplasty. Half treatment is worse than none at all in most cases. Doctors must know not only diagnosis of tuberculosis, but

treatment as well so that if a sanatorium is not available, discipline must be established in the home. All active cases of pulmonary tuberculosis must be isolated from those who are free of the disease if we wish to keep down the morbidity rate and check its spread. Prevention will be the future treatment of tuberculosis.

Finally: Remember to always take a careful history of every case, because each disease has its own specific history which gives the cue to the diagnosis. A careful physical examination with the patient stripped to the waist should be routine. Sputum examination should be repeated again and again, and remember that the x-ray aids you in your earliest diagnosis. Also remember that pneumothorax can not be given successfully or scientifically without the use of the fluoroscope, always checking before and after each treatment.

Physicians practicing in small communities have excellent opportunities in establishing themselves as pioneers in developing tuberculosis clinics, educating the school children, mothers and fathers of the township, interesting the ministers in preaching the Gospel of Health along with the Salvation of the Soul. In short, let your community become Tuberculosis Conscious!

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Organization News

ST. LOUIS MEETING

SCIENTIFIC EXHIBIT

The exhibit arranged by Dr. H. I. Spector, St. Louis, Missouri, Chairman of the Scientific Program Committee of the St. Louis Meeting of the American College of Chest Physicians, was the best attended exhibit of any shown at the meeting.

The exhibit consisted of a series of roentgenograms and case histories showing the differential diagnosis of pleurisy with effusion. Dr. Spector conducted a series of lectures at the exhibit and 451 physicians registered at the booth for sample copies of *Diseases of the Chest*.

FIFTH ANNUAL BANQUET

Who's who in the field of chest diseases assembled at the Chase Hotel, St. Louis, on Sunday night, May 14th, to assist in closing the most successful meeting of the American College of Chest Physicians held to-date.

Dr. Louis Boislinere, the dean of the chest physicians at St. Louis, was toastmaster and he introduced the officers of the College for brief remarks. Those who spoke were: Drs. E. W. Hayes, Monrovia, Past President of the College; Champ H. Holmes, Atlanta, Georgia, retiring President; Ralph C. Matson, Portland, Oregon, President; John H. Peck, Oakdale, Iowa, President-elect; Benjamin Goldberg, Chicago, Illinois, First Vice-President; J. Winthrop Peabody, Washington, D. C., Second Vice-President; Robert B. Homan, Jr., El Paso, Texas, Secretary-Treasurer; Frank Walton Burge, Philadelphia, Pennsylvania, Chairman of the Board of Regents; C. M. Hendricks, El Paso, Texas, First Editor of *Diseases of the Chest*; F. M. Pottenger, Monrovia, California; and E. J. O'Brien, Detroit, Michigan.

To Dr. Andrew C. Henske and his able committee, the College extends its thanks for a very enjoyable evening. Mrs. H. I. Spector was chairman of the Hostess Committee, and the wives of the other fellows of the College at St. Louis, who served on this committee were: Mesdames Alfred Goldman, Andrew C. Henske, and Lawrence Schlenker.

THANKS

A vote of thanks is extended to all of the members of the College in Missouri who arranged for the Fifth Annual Meeting of the College at St. Louis, May 13-14, 1939.

The American College of Chest Physicians has just concluded another successful meeting. One hundred and thirty-six fellows of the College and their friends registered at the St. Louis Meeting. They came from 27 states, the District of Columbia, and Mexico. Missouri, which was the host state, registered 34 physicians. Illinois was second with 14, and Texas followed closely with 12 registrations.

One hundred and two physicians registered as fellows of the American College of Chest Physicians. This is approximately twenty per cent of the entire membership of the College. The American Medical Association with 7,000 registrations, covers a little less than ten per cent of its membership.

We are very pleased with the showing made by the fellows of the American College of Chest Physicians.

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(Continued on page 28)

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(Continued on page 30)

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STATE TUBERCULOSIS ASSOCIATION MEETINGS

ILLINOIS

Dr. Fred M. F. Meixner, Fellow of the American College of Chest Physicians, was general chairman and served on the program committee for the Annual Convention of the Illinois Tuberculosis Association at Peoria. The meeting was held May 24th and 25th, during the course of which Dr. Meixner presented a paper outlining a joint project for tuberculosis control of the County Sanatorium Commission, the City Sanitarium and the County Tuberculosis Association.

TEXAS

Drs. J. B. McKnight and C. J. Koerth, Fellows of the American College of Chest Physicians, acted as presiding officers at respective sessions of the Thirtieth Annual Meeting of the Texas Tuberculosis Association, which was held at Temple on April 13th, 14th, and 15th. Other Fellows of the College on the program were Drs. H. F. Carman, Dallas; J. W. Laws, El Paso; F. N. Moore, Austin; and J. R. Phillips, Houston.